City of Santa Monica
Environmental Programs Division
Water Resources Section

Grant Application to the
Department of Water Resources for

2003
Proposition 13
Urban Water Conservation
Program

December 3, 2002

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Application Part A — Project Description, Organizational, Financial and Legal Information

A-1 Urban Water Conservation Grant Application Cover Sheet

1. Applicant (Organization or affiliation): **City of Santa Monica**
2. Project Title: **Comprehensive Medical Facility Turn-key Program**

3. Person authorized to sign and submit proposal:

Name, Title	**Susan McCarthy**
Mailing address	1685 Main Street Santa Monica California 90401
Telephone	(310) 458-8301
Fax	(310)
E-mail	Susan-Mccarthy@ci.santa-monica.ca.us

4. Contact person (if different):

Name, Title	**Kim O'Cain**
Mailing address	200 Santa Monica Pier Santa Monica California 90401
Telephone	(310) 458-8972
Fax	(310)
E-mail	Kim-Ocain@ci.santa-monica.ca.us

5. Funds requested (dollar amount): **$126,300**
6. Applicant funds pledged (local cost share) (dollar amount): **$50,000**
7. Total project costs (dollar amount): **$706,300**

8. Estimated net water savings (acre-feet/year): **83**
   Estimated total amount of water to be saved (acre-feet): **1,572**
   Over ____ years
   varies* ***(*varies from 7 to 25 years)***
   Benefit/cost ratio of project for applicant: **2.86**
   Estimated $/acre-feet of water to be saved: **$449.30**

9. Project life (month/year to month/year): **10/03 – 9/05**
10. State Assembly District where the project is to be conducted: **41**
11. State Senate District where the project is to be conducted: **23**
12. Congressional District(s) where the project is to be conducted: **41, 23**
13. County where the project is to be conducted: **Los Angeles**
14. Do the actions in this application involve physical changes in land use, or potential future changes in land use?
    (a) Yes _____
    (if yes, complete the land use check list at http://www.calfed.water.ca.gov/adobe_pdf/Questionnaires_EC_Permits_Land Use.pdf and submit it with the proposal

    (b) No _____ ✔ _____

A-2 Application Signature Page

By signing below, the official declares the following:

The truthfulness of all representations in the application;

The individual signing the form is authorized to submit the application on behalf of the applicant;

The individual signing the form read and understood the conflict of interest and confidentiality section and waives any and all rights to privacy and confidentiality of the application on behalf of the applicant; and

The applicant will comply with all terms and conditions identified in this Application Package if selected for funding.

_____	Susan McCarthy, City Manager	_____
Signature	Name and title	Date

A-3 Application Checklist

Complete this checklist to confirm all sections of this application package have been completed.

Part A: Project Description, Organizational, Financial and Legal Information

___✓___A-1 Urban Water Conservation Grant Application Cover Sheet
___✓___A-2 Application Signature Page
___✓___A-3 Application Checklist
___✓___A-4 Description of project
___N/A_A-5 Maps
___✓___A-6 Statement of work, schedule
___✓___A-7 Monitoring and evaluation
___✓___A-8 Qualification of applicant and cooperators
___✓___A-9 Innovation
___✓___A-10 Agency authority
___N/A_A-11 Operation and maintenance (O&M)

Part B: Engineering and Hydrologic Feasibility (construction projects only)

___N/A_B-1 Certification statement
___N/A_B-2 Project reports and previous studies
___N/A_B-3 Preliminary project plans and specifications
___N/A_B-4 Construction inspection plan

Part C: Plan for Environmental Documentation and Permitting

___N/A _C-1 CEQA/NEPA
___N/A _C-2 Permits, easements, licenses, acquisitions, and certifications
___N/A _C-3 Local land use plans
___N/A _C-4 Applicable legal requirements

Part D: Need for Project and Community Involvement

___✓___D-1 Need for project
___✓___D-2 Outreach, community involvement, support, opposition

Part E: Water Use Efficiency Improvements and Other Benefits

___✓___E-1 Water use efficiency improvements
___✓___E-2 Other project benefits

Part F: Economic Justification, Benefits to Costs Analysis

___✓___F-1 Net water savings
___✓___F-2 Project budget and budget justification
___✓___F-3 Economic efficiency

Appendix: Benefit/Cost Analysis Tables

___✓___Tables 1; 2; 3; 4a, 4b, 4c, 4d; and 5

A-4 Description of Project

Health care institutions are consistently within the top 10 water users in any given community. The City of Santa Monica is one of the largest centers for health care in Southern California. Santa Monica's health care facilities consume over 20% of the City's commercial water demand.

The water conservation industry has not successfully penetrated this market. Audits and information have been offered to the customer, but water efficiency retrofits lag behind other market segments.

The City of Santa Monica proposes a Comprehensive Medical Facility Turn-key Program, providing FREE product and FREE installation for:

Product	Number of Units to be Retrofitted	Lifetime Water Savings
Pre-rinse Spray Valves	24	56 acre-feet
X-ray Recycling Systems	6	143 acre-feet
Ultra Low Flush Toilets	50	28 acre-feet
Zero Consumption Urinals	280	964 acre-feet
Flow Control Valves for Faucets	200	45 acre-feet
Cooling Tower Conductivity Controllers	10	336 acre-feet
Total		**1,570 acre-feet**

The total water savings goal is ***1,572 acre-feet*** over the lifetime of the products.

The total project cost is ***$706,300***. The grant request is for ***$126,300***. The annual project benefit equals $129,136 and the annual cost equals $45,140, giving the project a benefit to cost ratio of ***2.86.***

Why Medical Facilities?

This is an under-addressed market with high water usage. The water-consuming equipment in medical facilities is used heavily. For instance, x-ray machines in hospitals run 24 hours; seven days a week and cafeteria workers wash down dishes with pre-rinse spray nozzles 10 - 15 hours daily.

Why These Products?

The City of Santa Monica carefully selected the six products to be installed under this Program to offer significant savings per site. By providing a high level of savings per site, marketing, sales and administration costs are minimized.

The selected retrofit devices have documentation of hard, reliable water savings. The flow control valve is a more recent technology but, with a number of completed studies, the valve shows impressive water savings.

Listed in the chart below is each product, the expected water savings, and other benefits the products provide including wastewater and energy savings.

Product	Water Savings (gpd)	Lifetime Water Savings (acre-feet)	Wastewater Reduction and Energy Savings
Pre-rinse Spray Valves	300	2.35	▪ 2.35 acre-feet Wastewater ▪ 5,110 therms of Energy
X-ray Recycling Systems	2,123	23.77	▪ 23.77 acre-feet Wastewater
Ultra Low Flush Toilets	20	.56	▪ .56 acre-feet Wastewater
Zero Consumption Urinals	123	3.44	▪ 3.44 acre-feet Wastewater
Flow Control Valves for Faucets	20	.22	▪ .22 acre-feet Wastewater ▪ Energy Savings
Cooling Tower Conductivity Controllers	2,000	33.59	▪ 33.59 acre-feet Wastewater

Why a Turn-key Program?

Medical facilities are some of the hardest in which to sell environmental programs because the medical personnel's main focus is on patient care. Additionally, facility personnel are working with tight budgets and do not want to outlay money. They also are faced with stringent regulations, which make them cautious when implementing new technologies.

The way to overcome these sales barriers is to provide turn-key services with no out-of-pocket costs for the customer. The product offering will be limited to specific technologies that will be easily accepted by facility personnel and produce significant pay back.

With a turn-key program, the City will purchase and install product at wholesale cost. This cost reduction increases the cost-effectiveness of the installation. And with zero customer cost, the customer will see immediate utility savings.

The City of Santa Monica will hire *Sustainable Works,* a local environmental non-profit agency, to conduct the field portion of the Program. They will be responsible for sales activities, site inventory audit, spray valve installations, facilitating installations, data entry and conducting inspections. The City Program Manager will be responsible for all aspects of work performance, including vendor management, leading the sales activities, procuring the products, tracking and reporting Program information along with ensuring customer satisfaction.

A-6 Statement of Work, Schedule

There are 2 major hospitals, 19 board and care facilities, 60 medical office buildings and many other medical facilities within the City of Santa Monica. Our

approach is to target the "best bang for the buck" facilities first in the following order:

1) Hospitals
2) Board and Care Facilities
3) Medical Office Buildings

In looking at the three categories listed above, there are retrofit choices that are cost-effective in some of the categories, but not in all. For instance x-ray recycling systems are highly cost effective in hospitals (where the x-ray machine runs 24 hours, seven days a week) but not in doctor's offices where the medical staff turn on and off the machines as they use it. medical buildings with 8 hour work days. Each retrofit must pass a cost-benefit analysis threshold. Installation viability will be determined site-by-site.

Hospitals - Both St. John's Hospital and Santa Monica-UCLA Hospital are undertaking a remodeling process. As a result, both sites will be required to install ULFTs and low flow faucets per building code. The City of Santa Monica will be pursuing the hospitals and requesting that they take the step beyond these measures.

Hospital Target Technologies:

- The pre-rinse spray valves
- X-ray recycling systems
- Zero consumption urinals and
- Cooling tower conductivity controllers

Board and Care Facilities - X-ray recycling systems are usually not running 24/7 and may not be cost effective for this category. Additionally, these sites are fairly saturated with ULFTs. Some of the facilities will have cooling towers.

Board and Care Target Technologies:

- The pre-rinse spray valves
- Zero consumption urinals
- Flow control valves for faucets and
- Cooling tower conductivity controller

Medical Office Buildings - The program will target the larger sites that have not previously retrofitted their toilets. The main retrofit opportunity will be the public restrooms.

Medical Office Building Target Technologies:

- ULFTs
- Zero consumption urinals

- Flow control valves for faucets and
- Cooling tower conductivity controller

	Hospitals	Board & Care Facilities	Medical Office Buildings	Total
Sites Available	2	19	60	**81**
Sites to Participate	1	12	10	**23**
Pre-rinse Spray Valves	12	12	0	**24**
X-ray Recycling Systems	6	0	0	**6**
Ultra Low Flush Toilets	0	0	50	**50**
Zero Consumption Urinals	200	30	50	**280**
Flow Control Valves for Faucets	0	100	100	**200**
Cooling Tower Conductivity Controllers	4	1	5	**10**

Inventory Management
Inventory procurement and reconciliation will be handled by the City's Program Manager. All products will be competitively bid based upon City-designated standards.

The City will store the products in a City owned warehouse. Because the City currently has a ULFT direct install program there is space available and inventory systems in place.

Marketing
The City will mail an announcement letter to the all of the medical facilities in the targeted segments (Hospitals, Board and Care Facilities, and Medical Office Buildings) describing the Program and alerting them that Sustainable Works will be contacting them to schedule a site visit. Sustainable Works will then contact each medical facility customer and schedule the initial site visit.

Customer Site Visit
During the sales visit the Program Representative and City Program Manager will demonstrate the products, review the offering and benefits, payback and process for participating in the program. They will also provide the customer with comparable case studies, testimonials and customer references.

After the customer says yes (which may take multiple sales visits) the Program Representative will enroll the customer in the program and install the spray valves. Appointments will be made to install the toilets and flow control valves.

The conductivity controller, x-ray recycling system, and zero consumption urinals will require joint sales activities with the trade ally or distributor for each product.

On the following page is a list with major tasks and the associated costs for each task.

Program Costs per Tasks

Task	Start Date	End Date	Projected Costs
Contract Authorized between the City and DWR	6/03	10/03	N/A
Agreement Finalized between the City and Sustainable Works	6/03	10/03	N/A
Marketing and Sales Materials Developed and Printed	10/03	11/03	$2,500
The City Mails Letter/Announcement to Medical Facilities	11/03	2/04	$500
Sustainable Works Contacts Medical Facilities via Telephone	12/03	6/04	$2,500
The City Solicits Bids and Secures Purchase Orders for Products: ULFTs, Zero Consumption Urinals, X-ray Recycling Systems, Conductivity Controllers and Flow Control Valves	6/03	11/03	$500 See Product Costs Chart
Products are Delivered and Stored at City Warehouse ULFTs, Zero Consumption Urinals and Flow Control Valves	12/03	1	$0
The City Solicits Bids and Secures Agreement for Installation Services: ULFTs, Zero Consumption Urinals, X-ray Recycling Systems, Conductivity Controllers and Flow Control Valves	6/03	11/03	$1,500
The City Obtains Spray Valves from the CUWCC/CPUC Programs	6/03	11/03	$0
Sustainable Works Conducts Sales Visits including Combined Sales Visit with Product Vendors	12/03	12/04	$15,000
Sustainable Works Installs Spray Valves	12/03	12/04	See Product Costs Chart
Selected Plumbing Contractor Installs ULFTs, Urinals and Flow Control Valves	1/04	1/05	See Product Costs Chart
Selected Cooling Tower Service Company Installs Conductivity Controllers	1/04	6/05	See Product Costs Chart
Selected X-ray Machine Service Company Installs X-ray Recycling Systems	1/04	6/05	See Product Costs Chart
The City Creates a Database to Track Participation	10/03	1/04	$10,000
Sustainable Works Data Enters All Program Participant Information in Database	11/03	6/05	$2,500
Sustainable Works Conducts Post Installation Inspections	1/04	6/05	$10,000
The City Generates Monthly Reports	11/03	7/05	$1,500
The City Installs Meters on X-ray Systems and Conductivity Controllers and Conducts Regular Monitoring and Assessment	2/04	7/05	$2,500
The City Generates Quarterly Reports and Submits to DWR	12/04	9/05	$500
The City Generates Final Report and Submits to DWR	7/05	9/05	$500
Total			**$50,000**

Program Costs per Retrofit

Product	Number to be Retrofitted	Purchase Price	Installation Costs	Total Costs per Product	Total Program Costs	On-going Maint.
Spray Valves	24	$35	$15	$50	$1,200	N/A
X-ray Recycling Systems	6	$4,000	$150	$4,150	$24,900	$78,000
Ultra Low Flush Toilets	50	$160	$60	$220	$11,000	N/A
Zero Consumption Urinals	280	$300	$60	$360	$100,800	$420,000
Flow Control Valves for Faucets	200	$12	$15	$27	$5,400	N/A
Cooling Tower Conductivity Controllers	100	$1,300	$200	$1,500	$150,000	N/A
Total	**570**				**$158,300**	**$498,000**

Cost Sharing

As noted earlier, this program will be free to the customer. The funding will be shared by three sources:

- DWR
- Metropolitan Water District of Southern California (MWD)
- The City of Santa Monica
- The Medical Facility Customer

The Department of Water Resources funding will be allocated to cover the bulk of the Program costs including product purchases and installation.

MWD has an established funding mechanism in place for conservation retrofits through the Conservation Credits Program. The City of Santa Monica will be reimbursed a per-unit cost for each installation achieved. MWD's rebate amounts cover only a portion of the device cost. Payment per measure is according to the following rebate menu:

- Spray valves $50.00
- X-ray recycling devices $1,000.00
- ULFTs (in office buildings) $60.00
- Zero Consumption Urinals $60.00
- Faucet Flow Control Valves $0.00
- Conductivity Controllers $500.00

The City will fund $50,000 of the Medical Facilities Program. This money will support the administration, marketing, and monitoring and assessment costs.

The Medical Facility Customer will fund the on-going operations and maintenance of the equipment.

Below is the Program Budget and the anticipated funding amounts for the three contributing parties:

Total Program Budget

Funding Agency	Amount	%
MWD	$32,000	4%
City of Santa Monica	$50,000	7%
DWR	$126,300	17%
Medical Facility Customer	$498,000	72%
Total	**$706,300.00**	**100.00%**

A-7 Monitoring and Evaluation

A key reason that the City elected to install all products is to be assured that the devices are in fact installed. In addition, the City will perform the following monitoring activities:

1. X-ray and conductivity controllers will be metered to monitor water use before and after installations. City staff will install water meters on all x-ray machines and cooling towers that have retrofitted their equipment through this Program. The City will install the meters up to two months in advance of the installation and keep them installed for one year after the installation. The City will regularly monitor and record the water usage. All results will be published in the quarterly report to DWR. Because the City will be visiting the site and recording the meter usage information we will also be able to ensure the product is performing and the customer is satisfied.

2. 100% of all sites will be contacted by phone to determine:

    - Product(s) performance, and reliability;
    - Ease of maintenance
    - Facility manager satisfaction level
    - Staff and end-user satisfaction level
    - Savings

3. 100% of zero consumption urinals, as a new-to-market technology, will receive inspections to determine product reliability, customer satisfaction and savings.

4. 5% of medical buildings and board and care facilities that have not received one of on-site inspections described above will receive an on-site visit one year after the installation. The City will verify:

    - Product(s) performance
    - Installation persistence
    - Customer satisfaction
    - Savings

All customer data will be recorded and reported to DWR on a quarterly basis. This data will be available in hard copy and electronic format. The electronic format will be in Excel format.

Program Feedback and Mid-Course Changes

We expect that as implementation proceeds and as results of the monitoring and assessment are evaluated, fine-tuning of the Program will be required. This

includes monitoring of the production and water saving goals to actual achievements.
The Program team will regularly meet to evaluate the results and based on the results the team will brainstorm solutions and make the necessary Program changes.

A-8 Qualifications of the Applicant and Cooperators

Kim O'Cain will be the Program Manager assigned by the City to oversee the Medical Facility Program. Kim has experience in several environmental programs and has been running the City's residential and commercial water efficiency programs for the last two years. Kim's strong work ethic is driven by her personal commitment to environmental sustainability and she will do everything possible to meet program goals and requirements.

Sustainable Works is a non-profit organization that promotes sustainable practices in businesses, community colleges and residential communities. These programs show participants how to reduce environmental impacts and adopt sustainable lifestyles including water efficiency.

Specifically Sustainable Works has a "Green Business Program" that provides consultation to businesses throughout the greater Los Angeles Area. The consultation includes an initial assessment, environmentally-friendly recommendations derived from the assessment and resources for and assistance with implementation, staff training and employee education.

One key program Sustainable Works has been implementing for the City of Santa Monica is the Restaurant Retrofit Program. They have visited top water consuming restaurants within Santa Monica, conducted an environmental assessment, sold the customer on spray valves, ULFTs and zero consumption urinals, installed the spray valves and facilitated installations for the ULFTs and urinals. This program approach mirrors the medical facility approach. The current staff is expected to implement the Medical Facility Program, thus saving time in training and Program development. Chantel Zimmerman will serve as Program Manager.

Maureen Erbeznik will serve as consultant for this Program assisting with the design and implementation of sales and marketing activities. Maureen has been in the energy and water efficiency industry since 1988. Implementing over 25 programs, Maureen has run some of the nation's largest water conservation programs in the industry. Time and again, Maureen's clients have acclaimed her ability to implement operationally superior programs while achieving the production goals.

See *Attachment A* for all Program staff resumes.

A-9 Innovation

The medical facilities program has four elements of innovation:

1) **Innovative Products –** The City has elected to offer customer a menu of retrofit items; most of them long established and well known to medical facility managers. In an effort to advance conservation efforts to a new level, Santa Monica has included leading edge technologies that have shown strong performance. Those retrofits are:

    - X-ray Recycling Systems
    - Zero Consumption Urinals

2) **Bundling** - Most programs deal with a single technology. By taking the initiative to bundle multiple products and manage the process, the City will secure the maximum savings at each site and offset administration, sales and marketing costs.

3) "**Pushing the Market"** - The City of Santa Monica has long been known as an environmental leader, with City staff that will endeavor to "push the market" for technologies that are not yet readily available to the end-use customer.

    By providing a full-service program to the customer for Free the customer response will be dramatically heightened over traditional rebate programs, thus driving the market in order to spark more consumer interest. Over time customer demand builds. When demand increases sufficiently, the marketing equation flips…water agencies are no longer pushing the market; the customer is now driving the market.

    This is especially important with new technologies like the X-ray Recycling System and Zero Consumption Urinals. These products are not available "off the shelf" right now. There is only one manufacture of the X-ray Recycling System (C&A X-ray) and two manufactures of the Zero Consumption Urinals (Falcon and Waterless). The more demand we create…the more products will be available…and the lower the price to the consumer.

4) **Technology Transfer -** Another one of the City's goals is to transfer innovative program models to other water agencies. A factor of the design process was to ensure that the medical facilities program would be "replicate-able". In other words, this program can be transferred to other geographic locations and operated with comparable savings results. After the program is running according to plan, the City will provide support to other municipalities interested in replicating this program.

A-10 Agency Authority

Address the following five questions pertaining specifically to this application.

1. Does the applicant (official signing A-2, Application Signature Page) have the legal authority to submit an application and to enter into a funding contract with the State? Provide documentation such as an agency board resolution or other evidence of authority.

Yes, Susan McCarthy the City Manager for the City of Santa Monica has authority to submit an application and enter into a funding contract with the State. Due to the time constraints in generating this application we were unable to obtain a legal document from the City Council that authorized Susan McCarthy to sign contracts. We are in the process of getting the request on the Council agenda.

2. What is the legal authority under which the applicant was formed and is authorized to operate?

The City of Santa Monica is a municipal corporation.

3. Is the applicant required to hold an election before entering into a funding contract with the State?

No

4. Will the funding agreement between the applicant and the State be subject to review and/or approval by other government agencies? If yes, identify all such agencies (e.g. Local Area Formation Commission, local governments, U.S. Forest Service, California Coastal Commission, California Department of Health Services, etc.).

No

5. Is there any pending litigation that may impact the financial condition of the applicant, the operation of the water facilities, or its ability to complete the proposed project? If none is pending, so state.

No

Application Part D- Need for Project and Community Involvement

D-1 Need for the Project

There are two highly critical issues that call for the Medical Facilities Retrofit Program:

1. Santa Monica's Local Water Supply Issues

Throughout the decade of the 1990's, Santa Monica aggressively pursued water self-sufficiency by steadily increasing its groundwater production capabilities. Recognizing that every drop of locally produced water would reduce the City's (and the region's) demand on water imported from the Bay Delta. By 1996, groundwater accounted for 80% of the City's water supply.

However, a majority of Santa Monica's wells were shut down in the summer of 1996 due to contamination from MTBE, a gasoline additive. To this day, the affected wells remain idle and Santa Monica is continuing its aggressive pursuit of the responsible parties. Currently, only 4 of the City's 11 wells are producing water. Accordingly, 80% of the City's current water supply is purchased from Metropolitan Water District, much of which is from the Bay Delta. The City provides 13.2 million gallons of water per day to its customers, which includes residential and commercial customers within the City limits.

To help the City reduce imports and the environmental impacts on distant watersheds, the City is striving to implement aggressive long-term water efficiency and conservation programs, treatment of contaminated local groundwater supplies and the use of recycled urban runoff.

The City's proposed Medical Facility Retrofit Program is a comprehensive, innovative program designed to retrofit 23 sites and save 292 acre-feet of water over 25 years. Principally a large percentage of this would be saved from the Bay Delta as well as other distant water sheds.

2. Need to Offset A Regional Supply and Demand Imbalance

Metropolitan Water District is facing a significant decline in its imported water supply at the same time that population growth is increasing demand. A historic water accord was recently negotiated between MWD, the Coachella Valley Water District, the Imperial Irrigation District and the San Diego County Water Authority. Assuming the accord is officially ratified, MWD will have 15 years to wean itself of 750,000 acre-feet (AF) of water per year that it now draws from the Colorado River. This reduction of supply represents approximately 22 percent of current total urban demand in MWD's service area (currently about 3.5 million AF/year). Concurrently, population in MWD's service area is projected to grow by 4 million people between years 2000 to 2020, resulting in an increase in urban demand of approximately 1 million AF. The net result is an annual shortfall of 1.75 million AF (0.75 MAF plus 1.0 MAF) by year 2020 if nothing is done to resolve the shortfall.

Because the City of Santa Monica purchases 80% of its water from MWD any water efficiency implemented within the City will help the situation. The Medical Facility Program is particularly helpful because it is an unsaturated market with a high potential for savings.

D-2 Outreach, Community Involvement, Support, Opposition

Outreach

The City will be providing outreach to the business community. First, all medical facilities within the City will be notified of the program and given the option to participate in the program for cost-effective retrofits.

Manufacturers and trade allies of all of the products being offered will see increased opportunities. The City will work directly with these industries to notify them about the Program.

Community Involvement

As discussed earlier, the City has already solicited participation in the Program from a local non-profit community group, Sustainable Works. Sustainable Works has in place a "Green Business Program" that they will leverage as they implement the Medical Facility Program.

As part of the "Green Business Program" Sustainable Works trains the staff of businesses throughout Santa Monica on how they can help sustain the environment. For this Program they will train the medical staff on the importance of water conservation as well as ways to save both at work and at home.

Program Support

The City of Santa Monica approached a number of entities to test receptivity for this Program. The City Council, local politicians and medical facility customers were extremely receptive.

There are two hospitals within the City's limits; Saint Johns Hospital and Santa Monica- UCLA Medical Center. Strong program interest has already been received from Santa Monica Hospital. With such early support, the City is confident that our production goals are realistic and readily achievable.

Application Part E—Water Use Efficiency Improvements and Other Benefits

E-1 Water Use Efficiency Improvements

The City of Santa Monica carefully selected the six products to be installed under this Program to offer significant savings per site. Described below is each product, its water savings, costs and other benefits.

Pre-rinse Spray Valves

Pre-rinse spray valves are part of the dishwashing assembly and are used in the typical food service dish room to pre-clean the dishes prior to placement in the dishwasher. Almost every commercial kitchen in the country has one spray valve, and most hospitals have 4 to 6.

Most high-flow spray valves use over 3.0 gallons per minute of hot water and are used, on average 6 hours per day. In hospitals they could be used from 10 – 20 hours per day. The flow rate of water- and energy- efficient models is only 1.6 gpm. These units save the food service operator over 300 gallons of hot water per day and 300 gallons per day of wastewater reduction, which equates to approximately $1,000 in utility savings. The efficient models have an added benefit in that they are more effective in the cleaning of dishes due to the more intense spray; saving labor time in dishwashing. Note: Currently, there is no maximum flow rate established for these units and food service operators have the choice, when replacing a valve, between an inefficient and an efficient model.

The removal of an existing high-volume, inefficient pre-rinse spray valve and replacement with an efficient unit is a simple task and normally involves less than 10 minutes of labor.

The City will purchase spray valves for this Program and Sustainable Works will install them during the initial sales visit. The product to be purchased will pass specification created by the Food Service Technology Center in San Ramon, California. The Food Service Technology Center also studied the savings of these products and published the results in the 2002 CPUC Local Third Party Energy Efficiency Program.

- Total Spray Valves to be Retrofitted: 24
- Lifecycle of Spray Valve: 7 years

	Daily gpd	*Annual gpy*	*Lifetime acre-feet*	*Customer $ Savings*
Per Device Water Savings	300	109,500	2.35	$1,781
Per Device Wastewater Savings	300	109,500	2.35	$1,781
Per Device Energy Savings	2 therms	730 therms	5,110 therms	$3,066
Total Water Savings	7,200	2,628,000	56	$42,448
Total Wastewater Savings	7,200	2,628,000	56	$42,448
Total Energy Savings	48 therms	17,520 therms	122,640 therms	$75,584

X-ray Recycling Systems

X-ray film processors use water to rinse processing chemicals from the film before it enters the dryer section of the machine. There are four stages of x-ray film development. The third step of this process requires the film to go through a rinse cycle to remove any remaining chemicals. This is the point in the process in which the processor receives a constant supply of running tap water, up to 2.5 gpm, which also goes down the drain into the wastewater system.

Technology was made available in the mid 1990s that enables this equipment to reduce overall water consumption (and wastewater) by approximately 35,000 gallons per year – a dramatic 96% reduction. The device reduces the water used for cooling from a continuous flow to a time released set amount. The device is attached to the film processor unit and it captures and re-circulates water. The device holds 15 gallons of water and pumps water from the bottom of the tank into the processor. A timer releases a set amount of cool, fresh water, up to four gallons per hour, into the processor unit to maintain proper temperature control. The cool water enters at the bottom of the tank, near where water is pumped to the processor, an equal amount of "old" water flows to the drain at the top, near where the "old" water is returned to the tank form the processor.

No operational changes are necessary to use this technology, although the processor does need to be shut down during installation (about one hour). The cleaning schedule remains the same. There are additional maintenance costs because the recycling device will need to be cleaned at the same time the processor is cleaned and a biocide will need to added. This additional cost is $1,300 per year per machine.

Metropolitan Water District has tested the Water Saver/Plus equipment and verified the water savings and the results are published in their September 2001 study.

- Total X-ray Recycling Systems Installed 6
- Lifecycle of Recycling System 10 years

	Daily gpd	*Annual gpy*	*Lifetime acre-feet*	*Customer $ Savings*
Per Device Water Savings	2,123	774,895	23.77	$18,018
Per Device Wastewater Savings	2,123	774,895	23.77	$18,018
Total Water Savings	12,738	4,649,370	143	$108,394
Total Wastewater Savings	12,738	4,649,370	143	$108,394

ULF Toilets

Commercial ULF toilets have been on the market for almost 20 years and have been required for new construction since 1994. Our retrofit target for this product is medical office buildings. Based on the California Urban Water Conservation Council CII ULFT Study, ULF toilets in office buildings save 20 gallons per day. This retrofit will also result the equivalent amount of wastewater reduction.

- Total ULF Toilets to be Installed 50
- Lifecycle of Commercial ULF Toilet 25 years

	Daily gpd	*Annual gpy*	*Lifetime acre-feet*	*Customer $ Savings*
Per Device Water Savings	20	7,300	.56	$424
Per Device Wastewater Savings	20	7,300	.56	$424
Total Water Savings	1000	365,000	28	$21,224
Total Wastewater Savings	1000	365,000	28	$21,224

Zero Consumption Urinals

Zero consumption urinals do just what they say “consume zero water”. They rely upon a proven vertical trap principle. The urine flows down the drain trap insert. The urine passes through a floating layer of liquid, which forms a barrier that prevents sewer vapors from escaping into the restroom. Urine under the barrier layer, overflows into the central tube and flows down the conventional drain line.

Around since 1991, zero consumption urinals are a proven technology. They have been extensively used in high traffic facilities such as schools, factories, offices, restaurants and fairgrounds. They save up to 123 gallons per day of water and reduce wastewater by the same amount. Zero consumption urinals are engineered to out perform conventional urinals that use one gallon or one half gallon per flush. The zero consumption urinals do not require any water for flushing, are more hygienic than conventional urinals precisely because they do not use any water, and are less costly to operate due to reduced plumbing maintenance costs. Zero consumption urinals retrofit easily to a 2” drain line. New construction installations have the advantage that water supply lines do not have to be installed thereby reducing installation costs.

- Total Zero Consumption Urinals 280
- Lifecycle of Zero Consumption Urinals 25 years

	Daily gpd	*Annual gpy*	*Lifetime acre-feet*	*Customer $ Savings*
Per Device Water Savings	123	44,895	3.44	$2,608
Per Device Wastewater Savings	123	44,895	3.44	$2,608
Total Water Savings	34,440	12,570,600	964	$730,712
Total Wastewater Savings	34,440	12,570,600	964	$730,712

Flow Control Valves for Faucets

Custom flow control valves are solid-brass, self-cleaning flow control devices that can customize water-flow from a facet from _ gpm to 5 gpm. They are ideal for hospitals and medical facilities. The device is attached to the in-flow pipe under the sink providing flow reduction up to 85%. Because the device is installed under the sink, these tamper proof restrictors go undetected by the faucet user.

For the purposes of this evaluation we used a conservation savings number of 20 gallons per day. We believe they can achieve savings up to 85 gallons per day based on the traffic using the faucet. These valves like the spray valves not only save water but save wastewater and energy to heat the water.

- Total Flow Control Valves Installed 200
- Lifecycle of Flow Control Valves 10 years

	Daily gpd	*Annual gpy*	*Lifetime acre-feet*	*Customer $ Savings*
Per Device Water Savings	20	7,300	.22	$167
Per Device Wastewater Savings	20	7,300	.22	$167
Total Water Savings	4,000	1,460,000	45	$34,110
Total Wastewater Savings	4,000	1,460,000	45	$34,110

Cooling Tower Conductivity Controllers

Cooling towers have become the dominant method for extracting waste heat from open recirculating cooling water systems (chillers) and discharging this heat to the atmosphere. A water stream, known as bleedoff or blowdown, is withdrawn continuously or intermittently. When a conductivity controller is installed the water is withdrawn based upon the concentration ratio and system pH. Water is saved by increasing the cycles and only withdrawing and replacing water when the concentration ratio and system pH are at a maximum amount. These savings can be from 2,000 – 10,000 gallons per day based on the size of the cooling tower and number of cycles achieved. For the purposes of this proposal we chose to use the most conservative savings. Again this water reduction results in the same wastewater reduction.

- Total Conductivity Controllers Installed 10
- Lifecycle of Flow Control Valves 15 years

	Daily gpd	*Annual gpy*	*Lifetime acre-feet*	*Customer $ Savings*
Per Device Water Savings	2000	730,000	33.59	$25,393
Per Device Wastewater Savings	2000	730,000	33.59	$25,393
Total Water Savings	20,000	7,300,000	336	$254,688
Total Wastewater Savings	20,000	7,300,000	336	$254,688

E-2 Other Project Benefits

The medical facilities program offers benefits beyond conservation of supply water. Additional program benefits include:

- **Wastewater savings:** Every water-efficiency measure selected for this program also reduces wastewater. For all of the sites we estimate reducing wastewater by ***61,378 gallons per day*** and ***1,570 acre-f***eet over the lifetime of the products.

Product	Gallons Per Day Wastewater Reduced	Gallons Per Year Wastewater Reduced	Lifetime Acre-Feet Wastewater Reduced
Pre-rinse Spray Valves	7,200	2,628,000	56
X-ray Recycling Systems	12,738	4,649,370	143
Ultra Low Flush Toilets	1,000	365,000	28
Zero Consumption Urinals	34,440	12,570,600	964
Flow Control Valves for Faucets	4,000	1,460,000	45
Cooling Tower Conductivity Controllers	2,000	7,300,000	336
Total	61,378	28,972,970	1572

- **Energy savings:** By using less energy for heating water both kitchen spray valves and faucet flow control valves save energy. Each kitchen spray valves saves 2 therms of energy per day. There is not sufficient information to state the energy savings for flow control valves. We conservatively estimate the total energy savings to be ***122,640 therms*** saved over the lifetime of the spray valves for all the sites retrofitted.

- **Financial savings:** Significant utility and labor savings will be recognized by participating medical facility customers. Customer will recognize over ***$2.4 million in utility savings*** alone. The following chart depict the total utility savings (water, wastewater and energy) and by product.

Product	Financial Savings
Pre-rinse Spray Valves	$160,480
X-ray Recycling Systems	$216,788
Ultra Low Flush Toilets	$42,448
Zero Consumption Urinals	$1,461,424
Flow Control Valves for Faucets	$68,220
Cooling Tower Conductivity Controllers	$509,376

Total	$2,458,736.00

**Customer Costs Used to Equate Savings*

☑ ***Water*** *= Average commercial rate charged by the City of Santa Monica of* ***$758*** *per acre-foot or $1.74 per hundred cubic feet*

☑ ***Wastewater*** *=Average commercial rate charged by the City of Santa Monica* ***$758*** *per acre-foot or $1.74 per hundred cubic feet*

☑ ***Energy*** *(gas used to heat pre-rinse spray valve water) = Average commercial rate charged by Southern California Gas Company of* ***$.60*** *per therm*

- **Reducing the City's Water from the CalFed area**: Reducing the City's dependence on supplies purchased from Metropolitan Water District will in turn safeguard future supplies from CalFed. Other benefits include less habitat destruction through the pipeline system and reduction in energy for pumping and treatment. This Program ensures a sustainable approach to water management.

- **A replicate-able program design:** Another one of the City's goals is to transfer innovative program models to other water agencies. A factor of the design process was to ensure that the medical facilities program would be "replicate-able". In other words, this program can be transferred to other geographic locations and operated with comparable savings results. After the program is running according to plan, the City will provide support to other municipalities interested in replicating this program.

- **Market transformation for "new to market" products:** By providing a full-service program to the customer for Free, the customer response will be dramatically heightened over traditional rebate programs, thus driving the market in order to spark more consumer interest. Over time customer demand builds. When demand increases sufficiently, the marketing equation flips…water agencies are no longer pushing the market; the customer is now driving the market.

  This is especially important with new technologies like the X-ray Recycling System and Zero Consumption Urinals. These products are not available "off the shelf" right now. There is only one manufacture of the X-ray Recycling System (C&A X-ray) and two manufactures of the Zero Consumption Urinals (Falcon and Waterless). The more demand we create…the more products will be available…and the lower the price to the consumer.

- **Drought preparedness offers future economic relief:** Droughts cause a damaging economic impact on the community affected. Heavy droughts can mean that car washes are shut down, jobs put on hold, and expensive landscaping damaged. It is inevitable that Southern California will experience another drought. The question is when and how severe the next one will be. One way to lessen the severity of the drought's effect on the City is to prepare

in advance for this event by creating a community that operates at a high level of efficiency.

- **Environmental sustainability:** As a signatory to the California Urban Water Conservation Council (CUWCC), the City has an obligation to implement the 14 Best Management Practices (BMPs) for water conservation. Additionally, the City implemented the Sustainable Cities Program that devotes the City to a way of life that safeguards our resources; prevents harm to the environment; and benefits the community. As a way to meet these goals, Santa Monica has committed to a water demand reduction goal of 20% over the 2000 base year demand. This Program will help meet those goals.

- **Employment and Training Opportunity:** For this program the environmental community group *Sustainable Works* will provide additional training and jobs. Sustainable Works will also train medical facility personnel on the importance of water conservation and ways to save.

Application Part F – Economic Justification: Benefits to Costs

F-1 Net Water Savings

Documented below are the net water savings to be achieved by the Medical Facility Program. The savings are based on industry accepted numbers and in most cases are conservative in nature.

Product	Number Retrofitted	Savings per Product gpd	Annual Savings gpy	Life of Product (years)	Lifetime Savings (acre-feet)	Total Daily Savings (gallons)	Total Annual Savings (acre-feet)	Total Savings (acre-feet)
Spray Valves	24	300	109,500	7	2.35	7,200	8	56
X-ray Recycling Systems	6	2,123	774,895	10	23.77	12,738	14	143
Ultra Low Flush Toilets	50	20	7,300	25	0.56	1,000	1	28
Zero Consumption Urinals	280	123	44,895	25	3.44	34,440	39	964
Flow Control Valves for Faucets	200	20	7,300	10	0.22	4,000	4	45
Cooling Tower Conductivity Controllers	10	2,000	730,000	15	33.59	20,000	22	336
Total						**79,378**	**89**	**1,572**

F-2 Project Budget and Budget Justification

Documented below are the estimated costs for the Medical Facility Program. The costs are based on realistic prices to acquire the customer, purchase and install the products, administer the Program, and maintain the products over time.

Materials and Installation

Product	Number to be Retrofitted	Purchase Price	Installation Costs	Total Costs per Product	Total Program Costs
Spray Valves	24	$35	$15	$50	$1,200
X-ray Recycling Systems	6	$4,000	$150	$4,150	$24,900
Ultra Low Flush Toilets	50	$160	$60	$220	$11,000
Zero Consumption Urinals	280	$300	$60	$360	$100,800
Flow Control Valves for Faucets	200	$12	$15	$27	$5,400
Cooling Tower Conductivity Controllers	10	$1,300	$200	$1,500	$15,000
Total	**570**				**$158,300.00**

Administration

Administration is estimated at $50,000 and includes City staff time to run the program and Sustainable Works to conduct the field work including measurement and verification.

Administration, Marketing and Sales	Costs
City Responsibilities	
Marketing and Sales Materials	$2,500
City Mails Announcement Letters	$500
Product Bid Solicitation	$500
Installation Services Bid Solicitation	$1,500
Database Creation	$10,000
Monthly Report Generation	$1,500
Monitoring and Assessment	$2,500
Quarterly Report Generation	$500
Final Report Generation	$500
Sustainable Works Responsibilities	
Sales Call Scheduling	$2,500
Sales Call Visits	$15,000
Data Entry	$2,500
Post Installation Inspections	$10,000
Total	**$50,000**

Maintenance
Two of the products being offered require maintenance.

1) The x-ray recycling system requires that the additional part be cleaned on the same schedule as the processor. This cost is $1,300 per year for the life of the product. 10 years x $1,300 = $13,000 per machine for a total of $78,000 for 6 machines. This cost will be absorbed by the customer and offset by their annual water and wastewater savings.

2) The zero consumption urinals require the trap seal be regularly replaced. This cost an average of $60 per year for the life of the product. 25 years x $60 = $1,500 per urinal for a total of $420,000 for 280 urinals. Again this cost will be absorbed by the customer and offset by their annual water and wastewater savings.

Budget

Capital Cost Category	**Cost**
Land Purchase/Easement	N/A
Planning/Design/Engineering	N/A
Materials/Installation	$158,300
Structures	N/A
Equipment Purchases/Rentals	N/A
Environmental Mitigation/Enhancement	N/A
Construction/Administration/Overhead	$50,000
Project Legal/License Fees	N/A
Other	N/A
Total Capital Costs	$208,300
Capital Recovery Factor: use Table 6	Varies (see chart above)
Annual Capital Costs	**$20,540**
Total X-ray Recycling System Maintenance	$78,000
Annual X-ray Recycling System Maintenance	$7,800
Total Zero Consumption Urinal Maintenance	$420,000
Annual Zero Consumption Urinal Maintenance	$16,800
Total Annual Maintenance	**$24,600**

Total Program Budget without Maintenance = **$208,300**

Total Program Budget with Maintenance **= $706,300**

F-3 Economic Efficiency

During the evaluation process it has come to light that there are a number of ways to calculate the economic efficiency.

1. From the water agency's perspective using the avoided cost of water for the water agency and not including customer maintenance costs

2. From the water agency's perspective using the avoided cost of water for the water agency and including customer maintenance costs

3. From the customer perspective using the cost of water for the customer and including on-going maintenance costs (which the customer would typically pay for)

4. From the customer perspective using the cost of water, wastewater and energy and including on-going maintenance costs

From preliminary conversations with submitting water agencies we found that most were using Scenario 1 and some were using scenario 3 or 4, but not all were using the same one. So to minimize the burden placed upon DWR, we have provided three of the scenarios that we believe most water agencies will be submitting, Scenarios 1, 3 and 4 described above.

Detailed on the following three pages are the annual capital, maintenance and avoided costs for each product and each scenario with a grand total for each.

Scenario 1

Scenario 1 evaluates the project based on the avoided costs of purchasing water. For the City of Santa Monica this equates to $435 or the purchase price from Metropolitan Water District. This scenario does not include maintenance costs. The maintenance costs will be paid for by the customer and easily covered by their water, wastewater and energy savings.

This scenario provides a cost/benefit ratio of **1.76**.

	Spray Valves	X-ray Rcyclng Systems	ULFTs	Zero Cnsmptn Urinals	Flow Cntrl Vlves for Faucets	Cooling Tower Cndctvty Contrllrs	Total
Capital Costs							
Materials/Installation	$1,200	$24,900	$11,000	$100,800	$5,400	$15,000	$158,3
Administration	$8,333	$8,333	$8,333	$8,333	$8,333	$8,333	$50,0
Total	$9,533	$33,233	$19,333	$109,133	$13,733	$23,333	$208,3
Capital Recovery Factor	0.1791	0.1359	0.0782	0.0782	0.1359	0.103	
Annual Capital Costs	$1,707	$4,516	$1,512	$8,534	$1,866	$2,403	$20,5
Annual O&M Costs							
Maintenance	$0	$0	$0	$0	$0	$0	
Total	$0	$0	$0	$0	$0	$0	
Total Annual Costs	**$1,707**	**$4,516**	**$1,512**	**$8,534**	**$1,866**	**$2,403**	**$20,5**
Avoided Costs							
Cost of Water	$435	$435	$435	$435	$435	$435	$4
Annual Displaced Water	2.35	14.26	1.12	38.56	4.48	22.39	83
Annual Avoided Costs	$1,022	$6,203	$487	$16,774	$1,949	$9,740	$36,1
Benefit/Cost Ratio							
Project Benefits	$1,022	$6,203	$487	$16,774	$1,949	$9,740	$36,1
Project Costs	$1,707	$4,516	$1,512	$8,534	$1,866	$2,403	$20,5
Benefit/Cost Ratio	***0.60***	***1.37***	***0.32***	***1.97***	***1.04***	***4.05***	***1.***

Scenario 3

Scenario 1 evaluates the project based on what it costs to deliver water to the customer (or the cost of water to the customer). For the City of Santa Monica commercial customers this equates to $758 per acre-foot. This scenario also includes the product maintenance costs that are typically absorbed by the customer. For this project there are two products that require additional maintenance: the x-ray recycling system and the zero consumption urinals. The x-ray recycling system requires additional cleaning of the recycling device at $1,300 per year of a total of $13,000 for the life of the product. Zero consumption urinals require the replacement of the trap seal every few months costing an average of $60 per year for the life of the product or $1,500.

This scenario provides a cost/benefit ratio of **1.4**.

	Spray Valves	X-ray Rcyclng Systems	ULFTs	Zero Cnsmptn Urinals	Flow Cntrl Vlves for Faucets	Cooling Tower Cndctvty Contrllrs	Total
Capital Costs							
Materials/Installation	$1,200	$24,900	$11,000	$100,800	$5,400	$15,000	$158,3
Administration	$8,333	$8,333	$8,333	$8,333	$8,333	$8,333	$50,0
Total	$9,533	$33,233	$19,333	$109,133	$13,733	$23,333	$208,3
Capital Recovery Factor	0.1791	0.1359	0.0782	0.0782	0.1359	0.103	
Annual Capital Costs	$1,707	$4,516	$1,512	$8,534	$1,866	$2,403	$20,5
Annual O&M Costs							
Maintenance	$0	$7,800	$0	$16,800	$0	$0	$24,6
Total	$0	$7,800	$0	$16,800	$0	$0	$24,6
Total Annual Costs	$1,707	$12,316	$1,512	$25,334	$1,866	$2,403	$45,1
Avoided Costs							
Cost of Water	$758	$758	$758	$758	$758	$758	$7
Annual Displaced Water	2.35	14.26	1.12	38.56	4.48	22.39	83
Annual Avoided Costs	$1,781	$10,809	$849	$29,228	$3,396	$16,972	$63,0
Benefit/Cost Ratio							
Project Benefits	$1,781	$10,809	$849	$29,228	$3,396	$16,972	$63,0
Project Costs	$1,707	$12,316	$1,512	$25,334	$1,866	$2,403	$45,1

	Spray Valves	X-ray Rcyclng Systems	ULFTs	Zero Cnsmptn Urinals	Flow Cntrl Vlves for Faucets	Cooling Tower Cndctvty Contrllrs	Total
Benefit/Cost Ratio	***1.04***	***0.88***	***0.56***	***1.15***	***1.82***	***7.06***	***1.***

Scenario 4

Scenario 4 evaluates the project based on the customer cost of water and includes the economic benefits of reduced wastewater and energy savings. This scenario does include the maintenance costs again covered by the customer.

This scenario provides a cost/benefit ratio of **2.86**.

	Spray Valves	X-ray Rcyclng Systems	ULFTs	Zero Cnsmptn Urinals	Flow Cntrl Vlves for Faucets	Cooling Tower Cndctvty Contrllrs	Total
Capital Costs							
Materials/Installation	$1,200	$24,900	$11,000	$100,800	$5,400	$15,000	$158,3
Administration	$8,333	$8,333	$8,333	$8,333	$8,333	$8,333	$50,0
Total	$9,533	$33,233	$19,333	$109,133	$13,733	$23,333	$208,3
Capital Recovery Factor	0.1791	0.1359	0.0782	0.0782	0.1359	0.103	
Annual Capital Costs	$1,707	$4,516	$1,512	$8,534	$1,866	$2,403	$20,5
Annual O&M Costs							
Maintenance	$0	$7,800	$0	$16,800	$0	$0	$24,6
Total	$0	$7,800	$0	$16,800	$0	$0	$24,6
Total Annual Costs	$1,707	$12,316	$1,512	$25,334	$1,866	$2,403	$45,1
Avoided Costs							
Cost of Water	$758	$758	$758	$758	$758	$758	$7
Cost of Wastewater Reduction	$758	$758	$758	$758	$758	$758	$7
Cost of Energy	$.60*	N/A	N/A	N/A	N/A	N/A	$.6
Annual Displaced Water	2.35	14.26	1.12	38.56	4.48	22.39	83.
Annual Avoided Water Costs	$1,781	$10,809	$849	$29,228	$3,396	$16,972	$63,0
Annual Avoided Wastewater Costs	$1,781	$10,809	$849	$29,228	$3,396	$16,972	$63,0
Annual Avoided Energy Costs	$3,066	N/A	N/A	N/A	N/A	N/A	$3,0
Benefit/Cost Ratio							
Project Benefits	$6,628	$21,618	$1,698	$58,456	$6,792	$33,944	$129,1

	Spray Valves	X-ray Rcyclng Systems	ULFTs	Zero Cnsmptn Urinals	Flow Cntrl Vlves for Faucets	Cooling Tower Cndctvty Contrllrs	Total
Project Costs	$1,707	$12,316	$1,512	$25,334	$1,866	$2,403	$45,1
Benefit/Cost Ratio	***3.88***	***1.76***	***1.12***	***2.30***	***3.64***	***14.13***	***2.***

**based on $.60 per therm the commercial rate for Southern California Gas Customers*

Appendix- Benefit/Cost Analysis Tables

Table 1: Capital Costs

Table 2: Annual Operations and Maintenance Costs

Table 3: Total Annual Costs

Table 4a: Water Supply Benefits: Avoided Cost of Current Supply Sources
Table 4b: Water Supply Benefits: Alternative Cost of Future Supply Sources
Table 4c: Water Supply Benefits: Water Supplier Revenue (Vendibility)
Table 4d: Total Water Supply Benefits

Table 5: Benefit/Cost Ratio

Table 6: Capital Recovery Factor

If Operation and Maintenance Costs or Benefits vary significantly over time, use the "Long Form" Tables provided on the website at: www.water.ca.gov.

Please contact Lorraine Marsh, DWR Economist at (916) 653-6414 or lmarsh@water.ca.gov if you need assistance or have any questions about the tables.

Table 1: Capital Costs, Scenarios 1 and 3

	Capital Cost Category *(a)*	Cost *(b)*
(a)	Land Purchase/Easement	N/A
(b)	Planning/Design/Engineering	N/A
(c)	Materials/Installation	$158,300
(d)	Structures	N/A
(e)	Equipment Purchases/Rentals	N/A
(f)	Environmental Mitigation/Enhancement	N/A
(g)	Construction/Administration/Overhead	$50,000
(h)	Project Legal/License Fees	N/A
(i)	Other	N/A
(j)	Total **(1)** (a + ... + i)	$50,000
(k)	Capital Recovery Factor: use Table 6	Varies (see chart above)
(l)	Annual Capital Costs (j x k)	$20,540

(1) Costs must match Project Budget prepared in Section F-2.

Table 2: Annual Operations and Maintenance Costs, Scenarios 3 and 4

Administration *(a)*	Operations *(b)*	Maintenance *(c)*	Other *(d)*	Total *(e)*
		$24,600		$24,600

Table 3, Scenario 1: Total Annual Costs without Maintenance

Annual Capital Costs (1) *(a)*	Annual O&M Costs (2) *(b)*	Total Annual Costs *(c)* *(a+b)*
$20,540	$0	$20,540

Table 3, Scenario 3 and 4: Total Annual Costs with Maintenance

Annual Capital Costs (1) *(a)*	Annual O&M Costs (2) *(b)*	Total Annual Costs *(c)*

		(a+b)
$20,540	$24,600	$45,140

(1) From Table 1 line (l)
(2*)* From Table 2 Total, column *(e)*

Table 4: Water Supply Benefits

Net water savings (acre-feet/year) ____83_____

4a. Avoided Costs of Current Supply Sources, Scenario 1

Sources of Supply *(a)*	**Cost of Water ($/AF)** *(b)*	**Annual Displaced Supply (AF)** *(c)*	**Annual Avoided Costs ($)** *(d)* *(b x c)*
City of Santa Monica (MWD Purchased)	$435	83	$36,175
Total			$36,175

4a. Avoided Costs of Current Supply Sources, Scenario 3

Sources of Supply *(a)*	**Cost of Water ($/AF)** *(b)*	**Annual Displaced Supply (AF)** *(c)*	**Annual Avoided Costs ($)** *(d)* *(b x c)*
City of Santa Monica (Water Delivered to Customer, Customer Costs)	$758	83	$63,035
Total			$63,035

4a. Avoided Costs of Current Supply Sources, Scenario 4

Sources of Supply *(a)*	**Cost of Water ($/AF)** *(b)*	**Annual Displaced Supply (AF)** *(c)*	**Annual Avoided Costs ($)** *(d)* *(b x c)*
City of Santa Monica Water (Delivered to Customer, Customer Costs)	$758	83	$63,035
City of Santa Monica Wastewater	**$758**	**83**	**$63,035**
Southern California Gas Energy	**$.60**	**5110**	$3,066
Total			$129,136

4b. Alternative Costs of Future Supply Sources

Future Supply Sources	Total Capital Costs ($)	Capital Recovery Factor (1)	Annual Capital Costs ($)	Annual O&M Costs ($)	Total Annual Avoided Costs ($)
(a)	*(b)*	*(c)*	*(d)* *(b x c)*	*(e)*	*(f)* *(d + e)*
Total					

(1) 6% discount rate; Use Table 6- Capital Recovery Factor

4c. Water Supplier Revenue (Vendibility)

Parties Purchasing Project Supplies *(a)*	Amount of Water to be Sold *(b)*	Selling Price ($/AF) *(c)*	Expected Frequency of Sales (%) (1) *(d)*	Expected Selling Price ($/AF) *(e)* *(c x d)*	"Option" Fee ($/AF) (2) *(f)*	Total Selling Price ($/AF) *(g)* *(e + f)*	Annu Expect Wate Sale Reven ($) *(h)* *(b x g*
Total							

(1) During the analysis period, what percentage of years are water sales expected to occur? For example, if water will only be sold half of the years, enter 50% (0.5).

(2) "Option" fees are paid by a contracting agency to a selling agency to maintain the right of the contracting agency to buy water whenever needed. Although the water may not be purchased every year, the fee is usually paid every year.

4d: Total Water Supply Benefits, Scenario 1

(a) Annual Avoided Cost of Current Supply Sources ($) from 4a, column (*d*)	$36,175
(b) Annual Avoided Cost of Alternative Future Supply Sources ($) from 4b, column (*f*)	
(c) Annual Expected Water Sale Revenue ($) from 4c, column (*h*)	
(d) Total Net Annual Water Supply Benefits ($) (a + b + c)	$36,175

4d: Total Water Supply Benefits, Scenario 3

(a) Annual Avoided Cost of Current Supply Sources ($) from 4a, column (*d*)	$63,035
(b) Annual Avoided Cost of Alternative Future Supply Sources ($) from 4b, column (*f*)	
(c) Annual Expected Water Sale Revenue ($) from 4c, column (*h*)	
(d) Total Net Annual Water Supply Benefits ($) (a + b + c)	$63,035

4d: Total Water Supply Benefits, Scenario 4

(a) Annual Avoided Cost of Current Supply Sources ($) from 4a, column (*d*)	$63,035
Annual Avoided Cost of Wastewater	$63,035
Annual Avoided Cost of Energy	$3,066
(b) Annual Avoided Cost of Alternative Future Supply Sources ($) from 4b, column (*f*)	
(c) Annual Expected Water Sale Revenue ($) from 4c, column (*h*)	
(d) Total Net Annual Water Supply Benefits ($) (a + b + c)	$129,136

Table 5, Scenario 1: Benefit/Cost Ratio

Project Benefits ($) (1)	**$36,175**
Project Costs ($) (2)	**$20,540**
Benefit/Cost Ratio	**1.76**

Table 5, Scenario 3: Benefit/Cost Ratio

Project Benefits ($) (1)	**$63,035**
Project Costs ($) (2)	**$45,140**
Benefit/Cost Ratio	**1.40**

Table 5, Scenario 4: Benefit/Cost Ratio

Project Benefits ($) (1)	**$129,136**
Project Costs ($) (2)	**$45,140**
Benefit/Cost Ratio	**2.86**

(1) From Tables 4d, row (d): Total Annual Water Supply Benefits
(2) From Table 3, column (*c)* : Total Annual Costs